

Gas Turbines

Assistant Engineers-DDE	Pages 2-27
First Assistant Engineer-Chief Engineer, Limited	Pages 28-51

1. (2.9.2.1-1) Compared to other types of engines, what is the biggest advantage of a GTE?

- ☐ (a) Low power-to-weight ratio.
- ☒ (b) High power-to-weight ratio
- ☐ (c) Simplicity of the control circuits.
- ☐ (d) Simplicity of installation.

If choice b is selected set score to 1.

2. (2.9.2.1-6) The term "divergent" is best described as _____.

- ☐ (a) thermal and kinetic energy being converted to mechanical energy
- ☐ (b) approaching nearer together, as the inner walls of a tube that is constricted.
- ☒ (c) moving away from each other, as the inner walls of a tube that flare outward
- ☐ (d) maintaining an equal distance between edges

If choice c is selected set score to 1.

3. (2.9.2.1-2) Which of the following terms refers to stator blades?

- ☐ (a) Shrouds.
- ☐ (b) Roots.
- ☒ (c) Vanes.
- ☐ (d) Nozzles.

If choice c is selected set score to 1.

4. (2.9.2.1-3) What are the two common forms of blade roots?

- ☐ (a) Fir tree and key.
- ☐ (b) Grub and bulb.
- ☐ (c) Saw tooth and knob.
- ☒ (d) Fir tree and bulb.

If choice d is selected set score to 1.

5. (2.9.3.1-5) In the operation of a marine propulsion gas turbine, kinetic and thermal energy required to drive the main propeller shaft are extracted by the _____.

- ☐ (a) multi-stage compressor
- ☐ (b) COWL diffuser
- ☐ (c) Variable Stator Vane actuators
- ☒ (d) power turbine

If choice d is selected set score to 1.

6. (2.9.3.0-3) Which of the following factors permits a gas turbine to produce 100% power?

- (a) Minimum air inlet temperature.
- (b) Maximum fuel flow.
- (c) Minimum air mass/weight flow.
- (d) Maximum combustion temperature.

If choice a is selected set score to 1.

7. (2.9.3.0-4) How do the high-velocity high-temperature gases cause the rotor of a gas turbine to rotate?

- (a) By creating a low-pressure area before the rotor.
- (b) By converting the high-velocity gas to low-velocity gas.
- (c) By transferring velocity energy and thermal energy to the turbine blades.
- (d) By increasing the velocity of the gases.

If choice c is selected set score to 1.

8. (2.9.3.0-4) In a gas turbine, the air charge is permitted to be compressed adiabatically by what factor, process, or condition?

- (a) Rapid heat transfer
- (b) Low-compression ratio
- (c) Interstage cooling
- (d) Speed of the process

If choice d is selected set score to 1.

9. (2.9.3.0-5) An "open cycle" of a gas turbine is best described by which of the following statements?

- (a) Energy is neither created nor destroyed and the cycle is therefore perpetual.
- (b) Energy is added externally.
- (c) Working fluids are taken in, transformed, and then recuperated.
- (d) Working fluids are taken in, transformed, and then discarded.

If choice d is selected set score to 1.

10. (2.9.3.1-1) The Brayton Cycle is a series of events best described by which of the following statements?

- (a) Intake, pressurization, ignition, exhaust.
- (b) Intake, compression, combustion, explosion, exhaust.
- (c) Intake, decompression, combustion, expansion, exhaust.
- (d) Intake, compression, combustion, expansion, exhaust.

If choice d is selected set score to 1.

11. (2.9.3.3-1) A gas turbine in which exhaust gas heat energy is added to the air charge between the compressor and combustion chamber is classified as a/an?

- ☐ (a) Open cycle engine.
- ☐ (b) Closed cycle engine.
- ☐ (c) Semi-open cycle engine.
- ☒ (d) Regenerative cycle engine.

If choice d is selected set score to 1.

12. (2.9.4.0-2) The purpose of the metal spray rub coating on the rotor and stator casing of a marine type gas turbine is to _____.

- ☐ (a) control airflow through the compressor
- ☒ (b) provide close vane to rotor and blade to stator case clearances
- ☐ (c) seal the circumferential dovetails
- ☐ (d) ensure protection for the gearbox adapter when removing or replacing the bearings

If choice b is selected set score to 1.

13. (2.9.4.0-1) The basic components of a gas turbine gas generator include which of the following?

- ☐ (a) compressor
- ☐ (b) combustor
- ☐ (c) turbine
- ☒ (d) All of the above

If choice d is selected set score to 1.

14. (2.9.4.1-1) What is the function of the stator in a gas turbine compressor?

- ☐ (a) To provide velocity energy.
- ☒ (b) To convert velocity to pressure.
- ☐ (c) To increase volume.
- ☐ (d) To convert pressure to velocity.

If choice b is selected set score to 1.

15. (2.9.4.1-2) A pressure stage of a gas turbine compressor consists of which of the following?

- ☐ (a) A set of stator blades.
- ☒ (b) A set of rotor blades and a set of stator blades.
- ☐ (c) A compressor rotor and a set of inlet guide vanes.
- ☐ (d) A set of rotor blades.

If choice b is selected set score to 1.

16. (2.9.4.1-3) Before combustion can occur, the combustion air must be delivered to the combustor at a high-pressure and low-velocity. High-velocity, low-pressure air is converted to high-pressure, low-velocity air at what part of the compressor?

- ☐ (a) Impeller.
- ☐ (b) Turning vanes.
- ☒ (c) Diffuser.
- ☐ (d) Inlet plenum.

If choice c is selected set score to 1.

17. (2.9.4.1-4) Why are loose-fitting blades used on the first several stages of large compressors?

- ☒ (a) To minimize vibration while the engine is passing through critical speed ranges.
- ☐ (b) To compensate for a malfunctioning compressor support bearing.
- ☐ (c) To compensate for the abrasive action of the blade tips.
- ☐ (d) To maintain close tolerances in the compressor.

If choice a is selected set score to 1.

18. (2.9.4.1-5) What is the disadvantage of a dual-entry centrifugal compressor compared to a single-entry centrifugal compressor?

- ☐ (a) The dual-entry compressor is larger in diameter.
- ☒ (b) A dual-entry compressor utilizes a more complicated inlet ducting.
- ☐ (c) The dual-entry compressor has a greater efficiency.
- ☐ (d) The dual-entry compressor rotates at slower speeds.

If choice b is selected set score to 1.

19. (2.9.4.1-6) Each stage of an axial-compressor of a gas turbine can compress the atmospheric air a total of how many times?

- ☐ (a) 2.2 times
- ☐ (b) 4.2 times
- ☒ (c) 1.2 times
- ☐ (d) 3.2 times

If choice c is selected set score to 1.

20. (2.9.4.1-7) What is a midspan platform?

- ☐ (a) A way of securing stator blades.
- ☐ (b) A support for the tips of stator blades.
- ☐ (c) The center of a two-piece rotor blade.
- ☒ (d) A wing tip on the face of long compressor rotor blades.

If choice d is selected set score to 1.

21. (2.9.4.2-1) Which of the following designs is the most satisfactory method for attaching turbine blades?

- ☐ (a) Pinning design.
- ☐ (b) Locking tab design.
- ☒ (c) Fir-tree design.
- ☐ (d) Retaining ring design.

If choice c is selected set score to 1.

22. (2.9.4.2-2) Turbine disks are commonly attached to the shaft by which of the following methods?

- ☒ (a) Bolted
- ☐ (b) Pressed
- ☐ (c) Pinned
- ☐ (d) Riveted

If choice a is selected set score to 1.

23. (2.9.4.2-3) What are the two common methods of power turbine blade retention?

- ☐ (a) Riveting and fir-free
- ☒ (b) Bulb and dovetail
- ☐ (c) Fir-tree and bolting
- ☐ (d) Bulb and bolting

If choice b is selected set score to 1.

24. (2.9.4.2-4) The turbine nozzle blades convert the combustion gases heat and pressure energy into what form of energy?

- ☐ (a) Electrical
- ☐ (b) Chemical
- ☐ (c) Thermal
- ☒ (d) Velocity

If choice d is selected set score to 1.

25. (2.9.4.2-5) The turbine nozzles function to direct the gases in what direction?

- ☐ (a) In the direction opposite of turbine rotation
- ☒ (b) In the direction of turbine rotation
- ☐ (c) Parallel to the turbine axis
- ☐ (d) Radial to the turbine axis

If choice b is selected set score to 1.

26. (2.9.4.2-6) What method is utilized to allow nozzle blades to withstand high inlet temperatures?

- ☐ (a) Laser cooling
- ☐ (b) Thermoelectric cooling
- ☐ (c) Water cooling
- ☒ (d) Air cooling

If choice d is selected set score to 1.

27. (2.9.4.3-1) A centrifugal-flow gas turbine uses what type of combustion chamber?

- ☐ (a) Double-Annular
- ☒ (b) Can
- ☐ (c) Can-Annular
- ☐ (d) Annular

If choice b is selected set score to 1.

28. (2.9.4.3-2) The short length of the can-annular combustion chamber provides for which of the following conditions?

- ☒ (a) Minimal pressure drop of the gases between the compressor outlet and the flame area.
- ☐ (b) Increased combustor temperature.
- ☐ (c) Maximum pressure drop of the gases between the compressor outlet and the flame area.
- ☐ (d) Decreased combustor temperature.

If choice a is selected set score to 1.

29. (2.9.4.3-3) In the marine gas turbine engine shown in the illustration, the purpose of the COWL and diffuser assembly installed in the combustor is to provide _____. Illustration GT-0009

- ☐ (a) even temperature distribution
- ☐ (b) uniform combustion
- ☒ (c) uniform air flow
- ☐ (d) All of the above.

If choice c is selected set score to 1.

30. (2.9.4.4-1) Aboard ship, single-shaft gas turbines are used mostly as prime movers for which of the following applications?

- ☐ (a) Auxiliary power units
- ☐ (b) Single-screw ships
- ☐ (c) Multi-screw ships
- ☒ (d) Generators

If choice d is selected set score to 1.

31. (2.9.4.4-2) Which type of GTE can handle a larger volume of air?

- (a) Twin-spool engine
- (b) Single-shaft engine
- (c) Centrifugal engine
- (d) Split-shaft engine

If choice a is selected set score to 1.

32. (2.9.4.4-3) Which of the following is an advantage of a single-shaft GTE compared to a split-shaft GTE?

- (a) Lower starting torque
- (b) Fewer moving parts
- (c) Reversible
- (d) Better fuel economy

If choice b is selected set score to 1.

33. (2.9.4.4-4) In a twin-spool turbine, secondary air is most essential for cooling in what section?

- (a) HP Compressor
- (b) HP Turbine
- (c) LP Turbine
- (d) LP Compressor

If choice b is selected set score to 1.

34. (2.9.4.5-1) What type of air seal is used in the sump and turbine areas of a GTE?

- (a) Labyrinth-Honeycomb
- (b) Lip Type
- (c) Fishmouth
- (d) Pneumatic carbon ring

If choice a is selected set score to 1.

35. (2.9.4.5-2) What type of air seal is used in the combustor and turbine midframe of a GTE?

- (a) Pneumatic carbon ring
- (b) Labyrinth-Honeycomb
- (c) Lip-Type
- (d) Fishmouth

If choice d is selected set score to 1.

36. (2.9.4.5-3) What type of seal is used in the gearbox of a GTE?

- ☐ (a) Lip-type
- ☐ (b) Fishmouth
- ☐ (c) Labyrinth-Windback
- ☒ (d) Carbon ring

If choice d is selected set score to 1.

37. (2.9.4.5-1) Ball or roller antifriction bearings are used to support GTE rotors for all EXCEPT which of the following?

- ☐ (a) To accommodate both axial and radial loads
- ☒ (b) To offer maximum rotational resistance
- ☐ (c) To facilitate precision alignment
- ☐ (d) To withstand high momentary overloads

If choice b is selected set score to 1.

38. (2.9.4.5-5) What is the purpose of the spring in a lip-type oil seal?

- ☐ (a) To remove burrs and dirt from the shaft
- ☒ (b) To keep the neoprene snugly fit around the shaft
- ☐ (c) To seal against maximum fluid pressure
- ☐ (d) To prevent air from entering the sump

If choice b is selected set score to 1.

39. (2.9.6.1-1) What type of starter is commonly used on smaller GTEs?

- ☐ (a) Pneumatic
- ☒ (b) Electric
- ☐ (c) Hydraulic
- ☐ (d) Air turbine

If choice b is selected set score to 1.

40. (2.9.6.1-2) Accelerating the compressor to the self sustaining speed of the engine is the function of which of the following components?

- ☐ (a) Mechanical driveshaft
- ☐ (b) Compressor extension shaft
- ☒ (c) Starter
- ☐ (d) PT shaft

If choice c is selected set score to 1.

41. (2.9.6.1-3) What type of engine starter motor is commonly found on the marine gas turbine shown in the illustration? Illustration GT-0006

- ☐ (a) AC induction motor
- ☒ (b) Hydraulic motor
- ☐ (c) DC series wound electric motor
- ☐ (d) AC synchronous motor

If choice b is selected set score to 1.

42. (2.9.6.2-1) During a "hung start" of a GTE, which of the following conditions will occur?

- ☐ (a) Lowering of the exhaust gas temperature
- ☒ (b) Overheating due to a lack of cooling air
- ☐ (c) Lowering of the turbine inlet temperature
- ☐ (d) Over speeding of the compressor

If choice b is selected set score to 1.

43. (2.9.7.0-1) As shown in the illustration, what is the purpose of pressurizing the main bearing lube oil sumps on a typical marine gas turbine? Illustration GT-0023

- ☐ (a) Assist in cooling the lube oil.
- ☒ (b) Minimizes oil leakage from the rotor shaft.
- ☐ (c) Increases lube oil penetration.
- ☐ (d) Provides uniform lube oil distribution around the bearing.

If choice b is selected set score to 1.

44. (2.9.7.0-2) Petroleum based lubricating oils are NOT suitable for use in GTEs for which of the following reasons?

- ☐ (a) They are not compatible with the metals used
- ☐ (b) They are less viscous than synthetic based oils
- ☐ (c) They break down the seals used on high-speed components
- ☒ (d) They will not withstand the high temperatures generated

If choice d is selected set score to 1.

45. (2.9.7.0-3) The lube oil system shown in the illustration is designed to lubricate the main bearings by what principle _____. Illustration GT-0023

- ☐ (a) totally submerged oil bath
- ☐ (b) splash lubrication
- ☐ (c) self contained partial oil bath
- ☒ (d) spray lubrication with dry sumps

If choice d is selected set score to 1.

46. (2.9.7.1-2) The purpose of the air/oil separator as shown in the illustration of a typical gas turbine lube oil system is to _____. Illustration GT-0024

- ☐ (a) reduce oil foaming
- ☐ (b) maintain oil pressure in the sumps
- ☒ (c) minimize oil consumption by separating oily vapors being vented to the atmosphere
- ☐ (d) All of the above

If choice c is selected set score to 1.

47. (2.9.7.1-6) The sensors which transmit remote system temperatures on marine gas turbines are usually constructed as _____.

- ☐ (a) electrical transducers
- ☐ (b) voltage dividers
- ☒ (c) RTD's
- ☐ (d) barometric thermistors

If choice c is selected set score to 1.

48. (2.9.7.1-2) The purpose of the lube oil supply check valves shown in the illustration, for a marine gas turbine lube oil system is to _____. Illustration GT-0024

- ☐ (a) keep the lube oil lines in the engine primed
- ☐ (b) prevent the lube oil and scavenge pump from losing its prime
- ☒ (c) prevent lube oil contained in the LO storage and conditioning tank tank from draining into gearboxes and sumps
- ☐ (d) All of the above

If choice c is selected set score to 1.

49. (2.9.7.1-5) The lube oil scavenge pressure on the marine gas turbine shown in the illustration, is sensed by a _____. Illustration GT-0017

- ☐ (a) manometer
- ☐ (b) RTD
- ☒ (c) transducer
- ☐ (d) probe

If choice c is selected set score to 1.

50. (2.9.7.1-8) Which of the following components removes the oil from the transfer gearbox?

- ☐ (a) Duplex filter assembly
- ☒ (b) Lube and scavenge pump
- ☐ (c) Air-Oil separator
- ☐ (d) Lube oil storage and conditioning assembly

If choice b is selected set score to 1.

51. (2.9.7.1-1) The main lube oil system pump check valves serve to maintain system prime and perform which of the following other functions?

- ☐ (a) to return oil to the main reduction gear sump
- ☒ (b) To prevent reverse flow of oil through a secured pump
- ☐ (c) To increase system pressure
- ☐ (d) None of the above

If choice b is selected set score to 1.

52. (2.9.7.1-9) The electrostatic vent fog precipitator removes oil mist from which of the following areas?

- ☐ (a) LO Storage Tank
- ☒ (b) Main Reduction Gear
- ☐ (c) Synchro-Self-Shifting Clutch
- ☐ (d) Gas Turbine Engine

If choice b is selected set score to 1.

53. (2.9.7.1-9) When the main reduction gear lube oil system is secured, which of the following components maintains the air within the casing at less than 35 percent relative humidity?

- ☐ (a) The rehumidifier
- ☐ (b) The precipitator
- ☐ (c) The reciprocator
- ☒ (d) The dehumidifier

If choice d is selected set score to 1.

54. (2.9.7.1-7) How is the lube oil supplied to each bearing in a GTE controlled?

- ☒ (a) By a calibrated orifice
- ☐ (b) By the lube oil pump
- ☐ (c) By a regulating valve
- ☐ (d) By a flow divider

If choice a is selected set score to 1.

55. (2.9.7.2-4) On the marine gas turbine lube oil system shown in the illustration, air and oil are separated in the air/oil separator mainly by the use of _____. Illustration GT-0024

- ☐ (a) filters
- ☒ (b) centrifugal force
- ☐ (c) baffles
- ☐ (d) strainers

If choice b is selected set score to 1.

56. (2.9.7.2-5) The main lube oil system used on the marine gas turbine engine shown in the illustration, is classified as a _____. Illustration GT-0017

- (a) dry-sump
- (b) common drain sump
- (c) oil mist recovery sump
- (d) wet-sump

If choice a is selected set score to 1.

57. (2.9.7.2-6) On the marine gas turbine engine as shown in the illustration, the main lube oil system is cooled by _____. Illustration GT-0017

- (a) central saltwater
- (b) reduction gear lube oil
- (c) central freshwater
- (d) main engine bleed air

If choice b is selected set score to 1.

58. (2.9.7.2-7) If the lube oil scavenge temperature exceeds 300 degrees F on the marine gas turbine engine shown, and reducing power does NOT bring the temperature within limits, the operator should _____. Illustration GT-0017

- (a) continue to operate at the reduced power level
- (b) monitor the temperature while continuing to operate
- (c) continue to reduce power on the engine
- (d) shutdown the engine and troubleshoot

If choice d is selected set score to 1.

59. (2.9.7.2-8) The lube oil system shown in the illustration, consists of which of the following sub-systems? Illustration GT-0024

- (a) Lube oil scavenging.
- (b) Sump venting.
- (c) Lube oil supply.
- (d) All of the above.

If choice d is selected set score to 1.

60. (2.9.7.2-6) On the marine gas turbine engine shown in the illustration, the 8th stage bleed air is used for _____. Illustration GT-0017

- (a) power turbine balance piston cavity pressurization
- (b) lube oil sump pressurization and cooling
- (c) high pressure turbine 2nd stage nozzle cooling
- (d) power turbine blade cooling

If choice b is selected set score to 1.

61. (2.9.8.0-1) What is the approximate percentage of air extracted from the compressor that is mixed with fuel for combustion in a gas turbine?

- ☐ (a) 50%
- ☒ (b) 25%
- ☐ (c) 12%
- ☐ (d) 75%

If choice b is selected set score to 1.

62. (2.9.8.0-2) The fuel oil system of a GTE provides all EXCEPT which of the following?

- ☐ (a) Acts as a hydraulic medium to actuate the fuel control
- ☐ (b) Provides accurately metered fuel for combustion
- ☐ (c) Controls the angle of the variable stator vanes
- ☒ (d) Acts as a cooling medium for the lube oil cooler

If choice d is selected set score to 1.

63. (2.9.8.3-1) What is the power source for the ignition exciter of a GTE?

- ☐ (a) Ship's 400 Hz system
- ☐ (b) Four lead-acid batteries
- ☐ (c) Ship's 28 volt DC system
- ☒ (d) Ship's 115 volt AC system

If choice d is selected set score to 1.

64. (2.9.8.3-2) In the ignition system of a GTE, how is optimum spark achieved?

- ☐ (a) Concentration of maximum energy in maximum time
- ☒ (b) Concentration of maximum energy in minimum time
- ☐ (c) Concentration of minimum energy in maximum time
- ☐ (d) Concentration of minimum energy in minimum time

If choice b is selected set score to 1.

65. (2.9.8.3-3) What is the most common type of spark igniter used on a GTE?

- ☐ (a) Suppression gap
- ☒ (b) Annular gap
- ☐ (c) Delayed gap
- ☐ (d) Resistive gap

If choice b is selected set score to 1.

66. (2.9.8.3-4) Which of the following statements is true concerning the fuel oil ignition system of the marine gas turbine engine shown in the illustration? Illustration GT-0017

- ☐ (a) The igniters will only energize if the exhaust gas temperature falls below a preset value.
- ☒ (b) The igniters will deenergize when the gas generator exceeds a preset RPM.
- ☐ (c) The igniters remain energized throughout the normal operation of the engine.
- ☐ (d) The igniters will deenergize when the power turbine exceeds a preset RPM.

If choice b is selected set score to 1.

67. (2.9.9.1-1) The lubrication principal used by the Kingsbury thrust bearing is _____.

- ☐ (a) free sliding oil film
- ☐ (b) square-shaped oil film
- ☒ (c) wedge-shaped oil film
- ☐ (d) cylinder-shaped oil film

If choice c is selected set score to 1.

68. (2.9.9.1-2) The main thrust bearing directly positions which part(s) of the main reduction gear?

- ☐ (a) High-speed gear
- ☐ (b) high-speed pinions
- ☐ (c) low-speed pinions
- ☒ (d) Low-speed gear

If choice d is selected set score to 1.

69. (2.9.9.2-1) The purpose of the main reduction gear in a marine gas turbine propulsion installation is to _____.

- ☐ (a) increases gas turbine speed to engage the clutch
- ☒ (b) transfer high-speed gas turbine rotation to low-speed propeller rotation
- ☐ (c) transfer low-speed gas turbine rotation to high-speed propeller rotation
- ☐ (d) reduces gas turbine speed to engage the clutch

If choice b is selected set score to 1.

70. (2.9.9.2-2) On some marine gas turbine reduction gear arrangements, the reduction gear lube-oil supply pump may also supply oil to which of the following components?

- ☒ (a) Main lube oil supply filter.
- ☐ (b) Main engine lube-oil pump.
- ☐ (c) Main engine oil cooler.
- ☐ (d) Main line shaft bearings.

If choice a is selected set score to 1.

71. (2.9.9.2-3) What type of main reduction gear arrangement prevents independent axial and rotational movement of the pinions?

- ☐ (a) Independent suspension
- ☒ (b) Locked train
- ☐ (c) Unlocked train
- ☐ (d) Hydraulic suspension

If choice b is selected set score to 1.

72. (2.9.9.2-4) The main reduction gear performs which of the following functions?

- ☐ (a) It transfers low-speed gas turbine rotation to high-speed propeller rotation
- ☐ (b) It increases gas turbine speed for clutch engagement
- ☐ (c) It reduces gas turbine speed for clutch engagement
- ☒ (d) It transfers high-speed gas turbine rotation to low-speed propeller rotation

If choice d is selected set score to 1.

73. (2.9.9.2-5) What feature is commonly used on articulated reduction gear arrangements for the correction of misalignment between the 1st reduction gear and the 2nd reduction pinions?

- ☒ (a) Quill shafts.
- ☐ (b) Fixed block pads.
- ☐ (c) Torsion pads.
- ☐ (d) Locked train shims.

If choice a is selected set score to 1.

74. (2.9.9.3-1) The term "lockout" on the Synchro-Self-Shifting (SSS) clutch system means that the _____.

- ☒ (a) SSS clutch will not engage
- ☐ (b) shaft will not rotate above 10 RPM's
- ☐ (c) reduction gear will not rotate
- ☐ (d) shaft will not rotate

If choice a is selected set score to 1.

75. (2.9.9.5-1) Rotation of the Controllable Pitch Propeller (CPP) blades is achieved through axial movement of what component in the hub body assembly?

- ☐ (a) The servomotor piston
- ☐ (b) The sliding block
- ☐ (c) The crankpin ring
- ☒ (d) The crosshead

If choice d is selected set score to 1.

76. (2.9.9.5-2) What is the purpose of the CPP hydraulic oil power system?

- ☐ (a) Supplies low pressure oil for both pitch control and stern tube sealing.
- ☐ (b) Supplies high pressure oil for both propeller blade actuation and stern tube sealing.
- ☐ (c) Supplies low pressure oil for propeller blade actuation and control oil for propeller pitch control.
- ☒ (d) Supplies high pressure oil for blade actuation and control oil for propeller pitch control.

If choice d is selected set score to 1.

77. (2.9.12.1-1) On the marine gas turbine shown in the illustration, the power turbine inlet pressure probes would be mounted nearest the area labeled _____. Illustration GT-0017

- ☐ (a) EE
- ☐ (b) CC
- ☒ (c) BB
- ☐ (d) AA

If choice c is selected set score to 1.

78. (2.9.12.1-2) On the marine gas turbine shown in the illustration, the fuel oil inlet temperature is sensed by _____. Illustration GT-0017

- ☒ (a) resistance temperature devices
- ☐ (b) voltage dividers electronically connected in parallel
- ☐ (c) pressure probe producing a single temperature signal
- ☐ (d) transducers at compressor inlet

If choice a is selected set score to 1.

79. (2.9.12.1-3) On most marine gas turbines used aboard ships, vibration sensors are identified as _____.

- ☐ (a) resistance temperature devices
- ☐ (b) frequency synthesizers
- ☐ (c) transducers
- ☒ (d) accelerometers

If choice d is selected set score to 1.

80. (2.9.12.1-4) On the marine gas turbine shown in the illustration, the compressor "inlet pressure" sensor would be located nearest the area labeled _____. Illustration GT-0017

- (a) DD
- (b) BB
- (c) AA
- (d) EE

If choice d is selected set score to 1.

81. (2.9.12.1-5) On the gas turbine engine shown in the illustration, the "T5.4" thermocouples are _____. Illustration GT-0006

- (a) electronically connected in series, producing a single temperature signal
- (b) electronically connected in parallel, producing 12 temperature signals from each of two harnesses
- (c) electronically connected in parallel, producing a single temperature signal from each of four harnesses
- (d) electronically connected in series, producing 12 temperature signals

If choice c is selected set score to 1.

82. (2.9.12.2-1) When auto starting a GTE similar to the one shown in the illustration, a "False Start" indication will initiate if which of the following conditions occurs? Illustration GT-0016

- (a) The gas generator rotor fails to reach a preset RPM after the power turbine begins to rotate.
- (b) The gas generator rotor fails to reach a preset RPM after the starting motor has been energized for a preset interval.
- (c) Power Turbine outlet temperature fails to reach a preset value.
- (d) The power turbine fails to reach a preset RPM after the gas generator reaches a preset RPM.

If choice b is selected set score to 1.

83. (2.9.12.2-4) During an auto-start sequence on the marine gas turbine control console shown in the illustration, what would be the correct order of events required to occur after the start sequence begins? Illustration GT-0016

- (a) NGG reaches idle RPM, Power turbine reaches ignition RPM, gas temperature greater than 400 degrees F.
- (b) NGG reaches ignition RPM, gas temperature greater than 400 degrees F, NGG reaches idle RPM
- (c) Power turbine reaches ignition RPM, gas temperature greater than 400 degrees F, Power turbine reaches idle RPM
- (d) Power turbine reaches ignition RPM, gas temperature greater than 400 degrees F, NGG reaches idle RPM

If choice b is selected set score to 1.

84. (2.9.12.2-2) On a ship with marine gas turbine engines as shown in the illustration, when the engine is operating normally, the enclosure heater will _____. Illustration GT-0022

- ☐ (a) always be energized
- ☒ (b) always be de-energized
- ☐ (c) only energize after the module cooling fans start
- ☐ (d) only de-energize when the vent dampers open

If choice b is selected set score to 1.

85. (2.9.12.2-3) In a GTE propulsion installation, the typical control system is designed to perform which of the following three functions?

- ☐ (a) operational control, speed control, and braking
- ☒ (b) operational control, safety control, and monitoring
- ☐ (c) pneumatic, hydraulic, and electric control
- ☐ (d) pneumatic control, electric control and monitoring

If choice b is selected set score to 1.

86. (2.9.13.0-1) What type of pliers are designed to reduce the time used in twisting wire on nuts and bolts?

- ☒ (a) Wire twister pliers
- ☐ (b) Cable cutters
- ☐ (c) Linesman pliers
- ☐ (d) Locking pliers

If choice a is selected set score to 1.

87. (2.9.13.0-2) To gain access to a nut or bolt in an area that is hard to reach, you should use what type of wrench?

- ☐ (a) Box end
- ☐ (b) Open end
- ☐ (c) Adjustable
- ☒ (d) Crowfoot

If choice d is selected set score to 1.

88. (2.9.13.0-3) With the exception of having a slot cut in the wrench head, a flare nut wrench is similar to what other wrench?

- ☐ (a) Open end
- ☐ (b) Slugging
- ☒ (c) Box
- ☐ (d) Dogging

If choice c is selected set score to 1.

89. (2.9.13.0-4) Wrenches that are recommended for use on GTEs should be plated with which of the following elements?

- ☐ (a) Bronze
- ☒ (b) Nickel
- ☐ (c) Carbon
- ☐ (d) Silver

If choice b is selected set score to 1.

90. (2.9.13.0-5) When you are using a stroboscope, if the flash speed is faster than the rpm of the object being tested, what effect will this appear to have on the object?

- ☐ (a) It will appear to stop rotation
- ☒ (b) It will appear to rotate backward
- ☐ (c) It will appear to rotate slow
- ☐ (d) It will appear to rotate forward

If choice b is selected set score to 1.

91. (2.9.13.0-6) Which of the following instruments is designed to help you when performing an internal inspection of the GTE?

- ☐ (a) Telescope
- ☐ (b) Stroboscope
- ☐ (c) Oscilloscope
- ☒ (d) Borescope

If choice d is selected set score to 1.

92. (2.9.13.0-7) Cadmium plated tools should NOT be used when performing maintenance on gas turbines because cadmium particles may become imbedded and cause embrittlement in materials made of _____.

- (a) nickel
- (b) chrome
- (c) titanium
- (d) silver

If choice c is selected set score to 1.

93. (2.9.13.0-8) Inspection mirrors are commonly used for which of the following purposes?

- (a) Installation and adjustment.
- (b) Inspections and adjustment.
- (c) Inspections and maintenance.
- (d) Installation and maintenance.

If choice c is selected set score to 1.

94. All marine gas turbine engine references, enclosure references, and clock positions apply to viewing the gas turbine engine shown in the illustration, from the _____. Illustration GT-0017

- (a) right side of the compressor to the left side
- (b) left side of the power turbine to the right side
- (c) intake end, looking toward the exhaust end
- (d) rear (exhaust end), looking toward the intake end

If choice d is selected set score to 1.

95. (2.9.13.5-1) Routine water washing of the marine gas turbine engine compressor shown in the illustration, is usually performed while operating _____. Illustration GT-0017

- (a) with the starter motor drive
- (b) at 75% power
- (c) at full power
- (d) at 25% power

If choice a is selected set score to 1.

96. (2.9.13.6-1) When removing the marine gas turbine engine as shown in the illustration, how is the engine removal accomplished? Illustration GT-0022

- (a) By removing the inlet screen, barrier wall and module front panel, then installing the rails and moving the engine into the engine room and up through the soft patch to the main deck.
- (b) By removing the exhaust boot, HSCS and PT, then lifting the engine up the exhaust stack.
- (c) By removing the inlet screen and barrier wall, then installing the rails and lifting the engine out through the inlet duct.
- (d) By removing the upper half casing and separately lifting out the compressor and power turbine rotors.

If choice a is selected set score to 1.

97. (2.9.14.1-1) On a propulsion marine gas turbine, if full power temperatures become excessive, what action should the operator take?

- (a) No action is needed until auto shutdown occurs.
- (b) Reduce power to stay within limits.
- (c) Borescope the engine.
- (d) Water wash the engine.

If choice b is selected set score to 1.

98. (2.9.14.1-2) While standing watch on a ship in the engine room with marine gas turbine engines as shown in the illustration, if after reducing power in response to a high lube oil supply temperature alarm, the temperature continues to increase, your next step should be to _____. Illustration GT-0017

- (a) continue to reduce power
- (b) shutdown the engine
- (c) water wash the engine
- (d) check oil consumption

If choice b is selected set score to 1.

99. (2.9.14.1-3) On a vessel equipped with marine propulsion gas turbines, the operators initial response to a high vibration alarm should be to _____.

- (a) switch to the secondary channel to confirm the alarm
- (b) reduce the engine speed
- (c) wait for the harmonic vibration to dampen out
- (d) change out the vibration transducer

If choice b is selected set score to 1.

100. (2.9.14.1-4) While standing watch underway on a ship with marine gas turbines shown in the illustration, a fire emergency stop is initiated when _____. Illustration GT-0017

- ☐ (a) either the primary or reserve GTM CO2 system activates
- ☐ (b) the GTM fire emergency shutdown switch located on the module is activated
- ☐ (c) one of the UV flame detectors is activated
- ☒ (d) All of the above

If choice d is selected set score to 1.

101. (2.9.14.1-5) The two main types of "compressor" stalls are known as _____.

- ☐ (a) flame out and inlet temperature stall
- ☐ (b) over-speed and overload stall
- ☒ (c) steady state and transient
- ☐ (d) rapid rise and temperature inversion

If choice c is selected set score to 1.

102. (2.9.15.1-1) When working with gas turbine synthetic lube oil, which of the following safety measures should always be observed?

- ☐ (a) thoroughly wash any area of skin contact
- ☐ (b) avoid prolonged inhaling of vapors
- ☐ (c) wear eye protection and rubber gloves
- ☒ (d) All of the above

If choice d is selected set score to 1.

103. (2.9.16.1-1) What is the purpose of the LM2500 GTE enclosure heater?

- ☐ (a) To increase inlet air temperature
- ☐ (b) To warm up the enclosure for maintenance personnel
- ☒ (c) To ensure fuel viscosity is maintained while the GTE is secured
- ☐ (d) To ensure enclosure temperature is maintained at 145 degrees F

If choice c is selected set score to 1.

104. (2.9.16.1-2) A total of how many shock mounts are used to secure the LM2500 enclosure to the ship's foundation?

- ☐ (a) 16
- ☐ (b) 40
- ☒ (c) 32
- ☐ (d) 24

If choice c is selected set score to 1.

105. (2.9.16.1-3) Where are the CO₂ nozzles located in the LM2500 enclosure?

- ☐ (a) Above and below the combustor section
- ☐ (b) On either side of the PT
- ☐ (c) Above the compressor
- ☒ (d) On the cross beam under the compressor front frame

If choice d is selected set score to 1.

106. (2.9.16.1-4) What type of combustor is used by the LM2500 GTE?

- ☐ (a) Can-annular
- ☐ (b) Can
- ☒ (c) Annular
- ☐ (d) Cannular

If choice c is selected set score to 1.

107. (2.9.16.1-5) The gas generator section of the LM2500 GTE is composed of all of the following components EXCEPT which one?

- ☐ (a) FOD screen
- ☐ (b) Bellmouth
- ☐ (c) Two stage HP turbine
- ☒ (d) Six stage LP turbine

If choice d is selected set score to 1.

108. (2.9.16.1-6) The struts of the compressor front frame provide passages for all of the following mediums EXCEPT which one?

- ☐ (a) Scavenge oil
- ☒ (b) Fuel oil
- ☐ (c) Seal-pressurization air
- ☐ (d) Lube oil

If choice b is selected set score to 1.

109. (2.9.16.1-7) What is the primary purpose of the diffuser and distributor on the LM2500 GTE?

- ☐ (a) To provide uniform air flow to the compressor
- ☐ (b) To provide even temperature distribution at the compressor
- ☒ (c) To provide uniform airflow to the combustor
- ☐ (d) To provide uniform airflow to the turbine

If choice c is selected set score to 1.

110. (2.9.16.1-8) Which of the following components prevent(s) objects smaller than 1/4 inch from entering the engine?

- ☐ (a) Inlet louvers
- ☒ (b) FOD screens
- ☐ (c) Centerbody
- ☐ (d) Demister pads

If choice b is selected set score to 1.

111. (2.9.16.1-9) How is the HP turbine rotor of the LM2500 GTE cooled?

- ☐ (a) By synthetic lube oil
- ☐ (b) By the ship's service seawater cooling system
- ☒ (c) By a continuous flow of compressor discharge air
- ☐ (d) By an air to air heat exchanger

If choice c is selected set score to 1.

112. (2.9.16.1-10) How many stages are in the HP turbine of the LM2500 GTE?

- ☐ (a) One
- ☒ (b) Two
- ☐ (c) Three
- ☐ (d) Four

If choice b is selected set score to 1.

113. (2.9.16.1-11) The power turbine (PT) of the LM2500 GTE has a total of how many stages?

- ☐ (a) Four
- ☒ (b) Six
- ☐ (c) Seven
- ☐ (d) Eight

If choice b is selected set score to 1.

114. (2.9.16.2-1) What is the primary function of the main fuel control on the LM2500 GTE?

- ☐ (a) To control fuel pump inlet pressure
- ☐ (b) To control stator vane angle and bleed air discharge
- ☒ (c) To control stator vane angle and GG speed
- ☐ (d) To control fuel temperature

If choice c is selected set score to 1.

115. (2.9.16.2-2) As shown in the illustration of a gas turbine fuel oil system, when the engine fuel oil valves are de-energized, the remaining fuel left in the system is recirculated back to the _____. Illustration GT-0021

- (a) day tank
- (b) high pressure relief valve
- (c) fuel purge manifold
- (d) fuel pump inlet

If choice d is selected set score to 1.

116. (2.9.16.4-1) In order to get a ready indication for a normal start with an LM2500 marine gas turbine, what permissive must be met?

- (a) Bleed air valve must be closed.
- (b) GG speed must be less than 1200 RPM and all engine trips reset.
- (c) Fuel supply pressure must be greater than 8 psig
- (d) All of the above.

If choice d is selected set score to 1.

117. (2.9.16.4-2) In the marine gas turbine engine shown in the illustration, the 9th stage bleed air is used for _____. Illustration GT-0017

- (a) high pressure turbine 2nd stage nozzle cooling
- (b) compressor balance piston cavity pressurization
- (c) power turbine cooling
- (d) sump pressurization and cooling

If choice c is selected set score to 1.

118. (2.9.16.4-3) In the marine gas turbine engine shown in the illustration, the 13th stage bleed air is used for _____. Illustration GT-0017

- (a) sump pressurization and cooling
- (b) power turbine balance piston cavity pressurization
- (c) power turbine cooling
- (d) high pressure turbine 2nd stage nozzle cooling

If choice d is selected set score to 1.

119. (2.9.16.4-4) In the marine gas turbine engine shown in the illustration, the HP turbine 2nd stage nozzle vanes are cooled by _____. Illustration GT-0020

- (a) frame vent bleed air
- (b) 13th stage compressor air
- (c) 16th stage compressor air
- (d) 9th stage compressor air

If choice b is selected set score to 1.

120. (2.9.16.4-5) As shown in the illustration, the HP turbine 2nd stage blades are cooled by convection, with the cooling air being discharged at the _____. Illustration GT-0011

- (a) nose holes on the leading edge
- (b) gill holes on the side
- (c) trailing edge slots
- (d) blade tips

If choice d is selected set score to 1.

121. (2.9.16.4-5) In the marine gas turbine engine shown in the illustration, the HP turbine 1st stage nozzle vanes are cooled by _____. Illustration GT-0020

- (a) 16th stage compressor air
- (b) 13th stage compressor air
- (c) 9th stage compressor air
- (d) 8th stage compressor air

If choice a is selected set score to 1.

1. (3.10.1.0-1) Boyle's law can best be defined as _____.

- (a) the volume of an enclosed gas varies inversely with the applied pressure, provided the temperature remains constant
- (b) if the pressure is constant, the volume of an enclosed gas varies indirectly with absolute temperature
- (c) a body at rest tends to remain at rest.
- (d) none of the above.

If choice a is selected set score to 1.

2. (3.10.1.0-2) In the operation of a marine propulsion gas turbine, kinetic and thermal energy required to drive the main propeller shaft are extracted by the _____.

- (a) power turbine
- (b) COWL diffuser
- (c) multi-stage compressor
- (d) Variable Stator Vane actuators

If choice a is selected set score to 1.

3. (3.10.1.0-3) On the gas turbine shown in the illustration, which of the following best describes the main principle of operation of the component contained within the area labeled "C"? Illustration GT-0001

- (a) Bernoulli's Law of Divergency
- (b) Newton's Law of Motion
- (c) Combustion at a constant pressure
- (d) Otto Cycle

If choice c is selected set score to 1.

4. (3.10.1.1-2) The term used to describe a gas turbine in which air drawn from the atmosphere passes through the engine only once is which of the following?

- (a) Unit-cycle.
- (b) Closed cycle.
- (c) Open cycle.
- (d) Semi-closed cycle.

If choice c is selected set score to 1.

5. (3.10.1.1-1) A gas turbine that has a regenerator between the compression and combustion sections in which exhaust gas heat energy is added to the air charge is classified as what type of engine?

- (a) Semi-open cycle engine.
- (b) Closed cycle engine.
- (c) Open cycle engine.
- (d) Semi-closed cycle engine.

If choice d is selected set score to 1.

6. (3.10.1.1-3) The term used to describe a gas turbine in which the turbine exhaust passes through a cooler and back to the compressor inlet is which of the following?

- (a) Uni-cycle.
- (b) Twin cycle.
- (c) Open cycle.
- (d) Closed cycle.

If choice d is selected set score to 1.

7. (3.10.1.2-2) What type of gas turbine cycle configuration is shown in the illustration? (See illustration GT-0031)

- (a) Recuperative type.
- (b) Simple type.
- (c) Intercooled type.
- (d) Intercooled-recuperated type.

If choice d is selected set score to 1.

8. (3.10.1.2-1) In a regenerative or recuperative gas turbine cycle configuration, the heat of the turbine exhaust gas is used to do what?

- (a) Heat the LP compressor discharge air before entering the HP compressor inlet.
- (b) Heat the intake air to the compressor.
- (c) Heat the combustor discharge gas before entering the turbine.
- (d) Heat the compressor discharge air before it enters the combustor.

If choice d is selected set score to 1.

9. (3.10.1.2-3) Based on the data shown in the illustration, which statement of the following is correct? Illustration GT-0030

- (a) The recuperated and intercooled-recuperated cycles gas turbines have the highest efficiency as compared to simple cycle gas turbines when operating at any load.
- (b) The simple cycle gas turbine cycle has the highest efficiency as compared to recuperated and intercooled-recuperated cycles when operating at full load.
- (c) There is no significant difference between the efficiencies of simple cycle gas turbine cycle and recuperated and intercooled-recuperated cycles when operating at low load.
- (d) The simple cycle gas turbine cycle has approximately the same efficiency as compared to recuperated and intercooled-recuperated cycles when operating at partial load.

If choice a is selected set score to 1.

10. (3.10.1.2-6) For the same amount of available power, how does a low speed two-stroke diesel engine compare to a recuperated gas turbine configuration?

- (a) The two-stroke diesel engine would burn more fuel and the particulate and nitrogen oxide (Knox) levels in the exhaust would be higher than that of a recuperated gas turbine configuration
- (b) The two-stroke diesel engine would burn less fuel and the nitrogen oxide (Knox) levels in the exhaust would be much lower than that of a recuperated gas turbine configuration.
- (c) The two-stroke diesel engine would burn more fuel than a recuperated gas turbine; however, the particulate and nitrogen oxide (Knox) levels in the exhaust would be lower.
- (d) The two-stroke diesel engine would burn less fuel than a recuperated gas turbine, however, the levels of particulate and nitrogen oxide (Knox) levels in the exhaust would be higher.

If choice d is selected set score to 1.

11. (3.10.1.2-4) Which of the following statements about the intercooled-recuperated gas turbine cycle is true? (Refer to Illustration GT-0031)

- (a) The intercooler serves to increase the required high-pressure compressor power while the recuperator utilizes waste heat from the exhaust to increase turbine inlet temperature.
- (b) The intercooler serves to increase the required high-pressure compressor power while the recuperator utilizes waste heat from the exhaust to decrease turbine inlet temperature.
- (c) The intercooler serves to reduce the required high-pressure compressor power while the recuperator utilizes waste heat from the exhaust to decrease turbine inlet temperature.
- (d) The intercooler serves to reduce the required high-pressure compressor power while the recuperator utilizes waste heat from the exhaust to decrease required fuel to achieve the turbine inlet temperature.

If choice d is selected set score to 1.

12. (3.10.1.2-5) For shipboard main propulsion application, how does a Intercooled-Recuperated (ICR) cycle gas turbine configuration compare to a Combined Cycle gas turbine configuration?

- (a) The combined cycle configuration is lower in efficiency, lighter, and takes up less space.
- (b) The ICR cycle configuration is more efficient, lighter, and takes up less space than a combined cycle configuration.
- (c) The combined cycle configuration is more efficient and takes up less space than a ICR cycle configuration.
- (d) Although the ICR cycle configuration is lower in efficiency, it is lighter and takes up less space than a combined cycle configuration.

If choice d is selected set score to 1.

13. (3.10.2.0-1) Assuming you maintain the same power output, how will a decrease in the compressor inlet air temperature effect a gas turbine engine's efficiency and fuel consumption?

- (a) Efficiency will increase and fuel consumption will decrease.
- (b) Efficiency will decrease and fuel consumption will increase.
- (c) Efficiency and fuel consumption will not be affected by a change in inlet air temperature.
- (d) Efficiency and fuel consumption will both increase.

If choice a is selected set score to 1.

14. (3.10.2.0-2) On a gas turbine engine, a high outside air temperature can cause high turbine inlet temperature, low mass/weight of airflow through the turbine, and which of the following conditions?

- (a) A requirement for less energy to achieve adequate compression
- (b) Cooler exhaust gas temperature
- (c) A requirement for more energy to achieve adequate compression
- (d) None of the above

If choice c is selected set score to 1.

15. (3.10.2.0-3) Assuming that the turbine inlet temperature of a gas turbine engine remains constant, which of the following operating parameter changes would be noted with an increase in the compressor inlet air temperature?

- (a) The mass air flow through the gas turbine would increase.
- (b) The power turbine output increases due to hot inlet air requiring less fuel to be heated to the same turbine inlet temperature.
- (c) The exhaust temperature would drop significantly.
- (d) The gas turbine power would drop due to reduced mass air flow.

If choice d is selected set score to 1.

16. (3.10.2.0-4) What action should you take if full power vibration limits are exceeded on a GTE?

- (a) Reduce power to stay within limits.
- (b) Borescope the engine.
- (c) No action is needed.
- (d) Water wash the engine.

If choice a is selected set score to 1.

17. (3.10.2.1-4) What design feature is incorporated into the main propulsion gas turbine to eliminate compressor surge?

- (a) Variable compressor stator vanes are used.
- (b) The governor adjusts the fuel to maintain the turbine inlet temperature constant.
- (c) The governor maintains the compressor turbine speed constant.
- (d) Fuel modulating function is incorporated into the governor control system.

If choice a is selected set score to 1.

18. (3.10.2.1-1) What is the designed compressor pressure ratio of the gas turbine compressor rotor shown in the illustration? Illustration GT-0004

- (a) 16 to 1
- (b) 20 to 1
- (c) 12 to 1
- (d) 10 to 1

If choice a is selected set score to 1.

19. (3.10.2.1-2) The two main types of "compressor" stalls are known as _____.

- (a) steady state and transient
- (b) over-speed and overload stall
- (c) flame out and inlet temperature stall
- (d) rapid rise and temperature inversion

If choice a is selected set score to 1.

20. (3.10.2.2-1) To prevent overheating of the illustrated turbine blade, which of the following fluids is circulated through it via the shaped internal passages? (See Illustration GT-0035)

- (a) Cooling water.
- (b) Cooling oil.
- (c) External compressed air.
- (d) Bleed air.

If choice d is selected set score to 1.

21. (3.10.3.1-1) Which of the following components are installed in the lube oil system shown in the illustration? Illustration GT-0024

- (a) pressurized sumps
- (b) air/oil separators
- (c) pressurized supply lines with separate scavenging return lines
- (d) all of the above

If choice d is selected set score to 1.

22. (3.10.3.1-2) How many lube oil sumps are installed on the marine gas turbine engine shown in the illustration? Illustration GT-0024

- ☐ (a) 3
- ☐ (b) 1
- ☐ (c) 2
- ☒ (d) 4

If choice d is selected set score to 1.

23. (3.10.3.1-3) Which of the following is true concerning the main engine lube oil system of the marine gas turbine shown in the illustration? Illustration GT-0024

- ☒ (a) The system includes a single combined lube oil supply and scavenge pump.
- ☐ (b) The line shaft bearing lubrication system is provided for by the LOSCA.
- ☐ (c) Lubrication is provided for the main reduction gears through the transfer gearbox.
- ☐ (d) All of the above.

If choice a is selected set score to 1.

24. (3.10.3.1-4) What type of main lube oil supply and scavenging pump is installed on the marine gas turbine engine shown in the illustration? Illustration GT-0017

- ☐ (a) Reciprocating piston.
- ☐ (b) Flexible diaphragm.
- ☒ (c) Vane.
- ☐ (d) Centrifugal.

If choice c is selected set score to 1.

25. (3.10.3.3-1) Which of the following is the most probable cause for the sump oil to be excessively aerated on an aero derivative main propulsion gas turbine engine?

- ☒ (a) The air oil separator is not functioning properly.
- ☐ (b) Air inlet temperatures to the compressor are higher than normal.
- ☐ (c) The compressor discharge pressure is lower than normal.
- ☐ (d) Exhaust pressures are lower than normal.

If choice a is selected set score to 1.

26. (3.10.3.3-2) Your first step in response to a GTE high lube oil sump temperature alarm would be _____.

- ☐ (a) check the oil filter differential pressure
- ☐ (b) de-couple the engine from the main reduction gear
- ☐ (c) check the oil pressure to the sump
- ☒ (d) reduce engine speed

If choice d is selected set score to 1.

27. (3.10.3.3-3) Lubricating oil contamination in a gas turbine bearing oil sump will most likely come from which of the following?

- ☐ (a) Failure of the lube oil pump.
- ☐ (b) Fuel oil contamination.
- ☐ (c) Failure of the scavenging pump.
- ☒ (d) Failure of seal pressurization air.

If choice d is selected set score to 1.

28. (3.10.4.1-1) The secondary passages on the gas turbine engine fuel nozzles shown in the illustration are designed to open at approximately what pressure? (See illustration GT-0005)

- ☐ (a) 130 PSIG
- ☒ (b) 330 PSIG
- ☐ (c) 230 PSIG
- ☐ (d) 30 PSIG

If choice b is selected set score to 1.

29. (3.10.4.1-2) How many fuel igniters would be installed on the marine gas turbine engine shown in the illustration? (See illustration GT-0017)

- ☐ (a) 3
- ☐ (b) 4
- ☐ (c) 1
- ☒ (d) 2

If choice d is selected set score to 1.

30. (3.10.4.1-3) The fuel oil back pressure regulator on the fuel system shown in the illustration, returns fuel to the _____. Illustration GT-0021

- ☐ (a) booster pump suction
- ☐ (b) purge valve discharge
- ☐ (c) fuel oil day tank
- ☒ (d) booster pump discharge

If choice d is selected set score to 1.

31. (3.10.4.1-5) The Main Fuel Control module used on a marine gas turbine engine as shown in the illustration, is responsible for managing which function(s)? Illustration GT-0021

- ☐ (a) deceleration schedule
- ☐ (b) variable stator vane feedback lever
- ☐ (c) acceleration schedule
- ☒ (d) all of the above

If choice d is selected set score to 1.

32. (3.10.4.1-7) The purpose of the air shroud (swirl cup) around the tip of the fuel nozzle of an LM2500 GTE is to _____.

- ☐ (a) To cool the nozzle tip.
- ☐ (b) air mixing
- ☐ (c) fuel mixing
- ☒ (d) All of the above

If choice d is selected set score to 1.

33. (3.10.4.3-1) A fuel analysis report for a gas turbine propelled vessel indicates a calcium level in excess of 0.5 ppm. High calcium levels in distillate fuels for gas turbines can cause which of the following?

- ☐ (a) Abrasive wear in the compressor section of the turbine.
- ☐ (b) Clogged fuel filters in the fuel service system.
- ☒ (c) Calcium deposits which can clog cooling holes in the turbine section.
- ☐ (d) Corrosion in the combustor section of the turbine.

If choice c is selected set score to 1.

34. (3.10.4.3-3) A gas turbine engine is experiencing a high rate of corrosion in the hot section of the engine. Which of the following fuel contamination issues could be associated with this problem?

- ☐ (a) High ash content in the fuel.
- ☐ (b) High particle content in the fuel.
- ☐ (c) Low pour point of the fuel.
- ☒ (d) High saltwater content in the fuel.

If choice d is selected set score to 1.

35. (3.10.4.3-2) During an operation of a gas turbine equipped with an intercooler and recuperator, a low combustion air temperature to the combustor section could be caused by which of the following?

- ☒ (a) Low exhaust temperature.
- ☐ (b) High fuel pressure to the combustor section.
- ☐ (c) Low water pressure to the intercooler.
- ☐ (d) High exhaust temperature.

If choice a is selected set score to 1.

36. (3.10.5.1.1-1) What does the term "lockout" of a Synchro-Self-Shifting (SSS) clutch system mean? (See illustration GT-0018)

- ☐ (a) Reduction gear will not rotate.
- ☐ (b) Shaft will not rotate above 10 RPM.
- ☒ (c) SSS clutch will not engage.
- ☐ (d) Shaft will not rotate.

If choice c is selected set score to 1.

37. (3.10.5.1.1-2) As shown in the illustration, the Synchro-Self-Shifting (SSS) clutch used on the marine gas turbine gears, requires which of the following inputs or conditions to make engagement possible? (See illustration GT-0018)

- ☐ (a) 2nd reduction pinion shaft speed less than that of the first reduction gear.
- ☒ (b) PT input shaft speed greater than that of the first reduction pinion.
- ☐ (c) LP air.
- ☐ (d) HP air.

If choice b is selected set score to 1.

38. (3.10.5.1.1-3) How is the clutch shown in the attached illustration engaged? (See illustration GT-0032)

- ☐ (a) Pneumatic pressure from the compressor engages the clutch.
- ☒ (b) Clutch engages automatically when input shaft flange is rotating faster than the output assembly.
- ☐ (c) Clutch engages automatically once the output assembly begins rotating.
- ☐ (d) Clutch is engaged manually prior to start up.

If choice b is selected set score to 1.

39. (3.10.5.1.1-4) On a gas turbine powered vessel equipped with a synchro self shifting (SSS) clutch, you are preparing for a power turbine over speed test. What would be an important action to take prior to starting the engine?

- ☐ (a) Remove the SSS clutch locking pawls.
- ☐ (b) Calculate the engagement speed of the SSS clutch.
- ☐ (c) Engage the SSS clutch using air pressure.
- ☒ (d) Manually lockout the SSS clutch from engaging using the special wrench provided.

If choice d is selected set score to 1.

40. (3.10.5.1.2-1) What type of main reduction gear arrangement prevents independent axial and rotational movement of the pinions?

- ☒ (a) Locked train
- ☐ (b) Hydraulic suspension
- ☐ (c) Unlocked train
- ☐ (d) Independent suspension

If choice a is selected set score to 1.

41. (3.10.5.1.2-2) The purpose of the main reduction gear in a marine gas turbine propulsion installation is to _____.

- ☒ (a) transfer high-speed gas turbine rotation to low-speed propeller rotation
- ☐ (b) reduces gas turbine speed to engage the clutch
- ☐ (c) transfer low-speed gas turbine rotation to high-speed propeller rotation
- ☐ (d) increases gas turbine speed to engage the clutch

If choice a is selected set score to 1.

42. (3.10.5.1.3-1) The main thrust bearing directly positions which part(s) of the main reduction gear?

- (a) Bull gear.
- (b) Low-speed pinion.
- (c) High-speed pinion.
- (d) High-speed gear.

If choice a is selected set score to 1.

43. (3.10.5.1.3-2) The lubrication principal used by the Kingsbury thrust bearing is the _____.

- (a) cylinder-shaped oil film
- (b) free sliding oil film
- (c) square-shaped oil film
- (d) wedge-shaped oil film

If choice d is selected set score to 1.

44. (3.10.5.2-2) Gear backlash is best described as which of the following?

- (a) Clearance of the gears operating in parallel.
- (b) Clearance of the gears that do not mesh.
- (c) Radial play between the pinion teeth and bearings.
- (d) Play between the surfaces of the teeth in mesh.

If choice d is selected set score to 1.

45. (3.10.5.2-3) In cases where both the pinion and gear teeth of the main reduction gear have been slightly indented by foreign material, what action should you take?

- (a) Both the pinion and gear should be relieved of all raised metal around the indentation.
- (b) Closely monitor the damage to see if it spreads.
- (c) Remove the foreign material that caused the indentation and return the unit to service.
- (d) Replace both the pinion and gear.

If choice a is selected set score to 1.

46. (3.10.5.2-3) When performing a static check to determine tooth contact, you should use which of the following compounds to coat the gear teeth?

- (a) Copper sulfate.
- (b) An indelible marker.
- (c) Prussian Blue.
- (d) Persian Blue.

If choice c is selected set score to 1.

47. (3.10.7.0-1) The buildup of contamination in a gas turbine will cause all of the following conditions EXCEPT which one?

- ☐ (a) Increased combustion gas temperatures
- ☐ (b) Restricted airflow
- ☒ (c) Reduced fuel consumption
- ☐ (d) Turbine blade corrosion

If choice c is selected set score to 1.

48. (3.10.7.0-2) The safety-wiring, or lock wiring, of gas turbine parts is required to _____.

- ☒ (a) prevent disengagement of parts
- ☐ (b) prevent corrosion
- ☐ (c) maintain lubrication
- ☐ (d) maintain fastener torque

If choice a is selected set score to 1.

49. (3.10.7.1-1) On a gas turbine powered vessel, what is the last step after an off-line water wash?

- ☐ (a) Open the Variable Stator vanes.
- ☒ (b) Start the engine to dry it out.
- ☐ (c) Release the gas generator brake.
- ☐ (d) Secure the starting system.

If choice b is selected set score to 1.

50. (3.10.7.1-2) The effectiveness of an off-line wash wash of a LM2500 GTE can be enhanced by doing which of the following?

- ☒ (a) Stroking the Variable Stator Vanes to the maximum open position.
- ☐ (b) Washing the power turbine while still hot.
- ☐ (c) Motoring the engine just short of idle speed.
- ☐ (d) Applying the power turbine brake.

If choice a is selected set score to 1.

51. (3.10.7.1-3) On a gas turbine propulsion vessel, you notice a slow but steady increase in gas turbine vibration and specific fuel consumption as the voyage has progressed. What would be a good maintenance technique to use to correct these increases?

- ☒ (a) Secure the engine and off-line water wash the compressor.
- ☐ (b) Increase the Variable Stator Vane setting to supply more air to the combustor.
- ☐ (c) On line water wash the Power Turbine.
- ☐ (d) Increase Gas Generator RPM to a more efficient setting.

If choice a is selected set score to 1.

52. (3.10.7.2-1) For maintenance, how can you reach the burner units of a can-annular combustor?

- (a) By removing the annular case
- (b) By removing the power turbine
- (c) By sliding the can-annular case aside
- (d) By disassembling the engine

If choice c is selected set score to 1.

53. (3.10.9.0-1) What are the two prime sources of deposits that build up on compressor blades?

- (a) Carbon residue and lube oil mist
- (b) Salt spray and carbon residue
- (c) Lube oil mist and fuel oil spray
- (d) Lube oil mist and salt spray

If choice d is selected set score to 1.

54. (3.10.8.0-2) You are preparing for a borescope inspection of a gas turbine engine. Prior to the inspection it is recommended that you do what?

- (a) Water wash the compressor.
- (b) Water wash the power turbine.
- (c) Not water wash the engine prior to the inspection.
- (d) Water wash both the compressor and the power turbine.

If choice a is selected set score to 1.

55. (3.10.8.0-2) On a LM2500 gas turbine engine, you are instructed to check the "A" sump three o'clock strut for a potential stress crack. Standing at the compressor air intake, where would this point be located?

- (a) To your left midway on the circumference.
- (b) To your right midway on the circumference.
- (c) At the top of the circumference.
- (d) Diametrically opposed from the CIT sensor.

If choice a is selected set score to 1.

56. (3.10.8.0-3) To manually rotate the LM 2500 GT engine, you should use which of the following tools?

- (a) 18-inch long 1/2-inch drive socket wrench.
- (b) A socket wrench with an 18-inch long 3/4-inch drive extension.
- (c) 18-inch long 3/4-inch drive socket wrench.
- (d) A socket wrench with an 18-inch long 1/2-inch drive extension.

If choice b is selected set score to 1.

57. (3.10.8.0-4) It is good engineering practice for you to review the machinery history of an engine before an borescope inspection for all EXCEPT which of the following reasons?

- (a) An electric drive motor.
- (b) An air drive motor.
- (c) A torque multiplexer.
- (d) A torque multiplier.

If choice d is selected set score to 1.

58. (3.10.8.1-1) You are preparing for a borescope inspection of an LM2500 gas turbine engine. You are reviewing the correct geometric orientation nomenclature which includes which of the following?

- (a) All references left, right, and radial are orientated as viewed from aft looking forward on the engine.
- (b) All references left, right, and radial are orientated as viewed from forward looking aft on the engine.
- (c) All references are made from the combustor section, forward to the hp turbine and aft to the power turbine.
- (d) All references are made from the combustor section, aft to the hp turbine and forward to the power turbine.

If choice a is selected set score to 1.

59. (3.10.8.1.-2) When conducting a borescope inspection, you must be aware of all except which of the following factors?

- (a) The inspection areas and ports.
- (b) The engineer's experience.
- (c) The internal reference points.
- (d) The limitations of your equipment.

If choice b is selected set score to 1.

60. (3.10.8.1-4) The six borescope ports located in the compressor rear frame casing of the marine propulsion gas turbine shown, can be used to inspect all EXCEPT which of the following components? Illustration GT-0006

- (a) 14th stage compressor blades.
- (b) Fuel nozzles.
- (c) Combustor.
- (d) 1st stage turbine nozzle

If choice a is selected set score to 1.

61. (3.10.8.2-1) On an LM2500 gas turbine powered vessel you are conducting a borescope inspection of the compressor. What is used on each compressor stage as a reference for indexing the blades?

- ☐ (a) The IGV actuator.
- ☒ (b) The locking lug blades.
- ☐ (c) Witness marks center punched on the #1 nozzle and blade.
- ☐ (d) Scribe marks located on the stator and rotor diaphragm.

If choice b is selected set score to 1.

62. (3.10.8.2-2) Zero reference for the LM2500 GTE is established by the use of which of the following engine components?

- ☒ (a) Locking lug blades.
- ☐ (b) Vane blades.
- ☐ (c) Carboloy blade pads.
- ☐ (d) Vane shrouds.

If choice a is selected set score to 1.

63. (3.10.8.2-3) When conducting a borescope inspection of the compressor, why can Airfoil and tip cracks be difficult to detect?

- ☐ (a) Rotating the rotor too fast.
- ☐ (b) Borescope optics have deteriorated.
- ☐ (c) The cracks are generally tight and shallow in depth.
- ☒ (d) All of the above.

If choice d is selected set score to 1.

64. (3.10.8.3-1) When inspecting the combustion section of a gas turbine engine, what wattage light source should you use?

- ☐ (a) 500 watt.
- ☒ (b) 1000 watt.
- ☐ (c) 250 watt.
- ☐ (d) 750 watt.

If choice b is selected set score to 1.

65. (3.10.9.0-1) When dissimilar metals come in contact with a conductor, which of the following types of metal deterioration takes place?

- ☐ (a) Rust erosion.
- ☐ (b) Chemical corrosion.
- ☒ (c) Electrochemical corrosion.
- ☐ (d) Etching erosion.

If choice c is selected set score to 1.

66. (3.10.9.0-2) A reddish -colored oxide usually forms on which of the following metals?

- ☐ (a) Aluminum.
- ☒ (b) Steel.
- ☐ (c) Chromium.
- ☐ (d) Magnesium.

If choice b is selected set score to 1.

67. (3.10.9.0-3) A white-gray powdery deposit can usually found on which of the following metals?

- ☐ (a) Steel.
- ☐ (b) Magnesium.
- ☐ (c) Magnetite.
- ☒ (d) Aluminum.

If choice d is selected set score to 1.

68. (3.10.9.0-4) Active corrosion on copper alloys is indicated by which of the following?

- ☐ (a) A white-gray powder formation.
- ☐ (b) A copper-oxide crust formation.
- ☒ (c) A gray-green patina formation.
- ☐ (d) A verdigris formation.

If choice c is selected set score to 1.

69. (3.10.9.0-5) Cadmium and zinc coatings provide which of the following types of protection for the base metal?

- ☐ (a) Sealant.
- ☐ (b) Chemical.
- ☐ (c) Thermal.
- ☒ (d) Sacrificial.

If choice d is selected set score to 1.

70. (3.10.9.1-1) Compressor tip clang can be usually attributed to which of the following operating conditions?

- ☒ (a) Compressor stall.
- ☐ (b) Overloading.
- ☐ (c) Continuous high-power operation.
- ☐ (d) Continuous low-power operation.

If choice a is selected set score to 1.

71. (3.10.9.1-2) Compressor rotor blade tip curl is usually caused by which of the following?

- (a) Misalignment.
- (b) Object damage.
- (c) Vane rub.
- (d) Blade rub.

If choice d is selected set score to 1.

72. (3.10.9.1-3) Once a compressor is broken in, which of the following factors will most likely cause blade tips to rub?

- (a) Sprayed material in the stator case
- (b) Elongation of the blade tips
- (c) Profiles on the blade tips
- (d) Failure of a rotor bearing

If choice d is selected set score to 1.

73. (3.10.9.1-4) What type of metallurgical failure does Item 1 represent in the illustration? (see Illustration GT-0038)

- (a) Rupture.
- (b) Radial cracking.
- (c) Creep.
- (d) Axial cracking.

If choice b is selected set score to 1.

74. (3.10.9.1-5) What type of metallurgical failure does Item 2 represent in the illustration? (see Illustration GT-0038)

- (a) Circumferential cracking.
- (b) Axial cracking.
- (c) Weld cracking.
- (d) Radial cracking.

If choice b is selected set score to 1.

75. (3.10.9.1-6) You are conducting a borescope inspection of the compressor section of a LM2500 gas turbine. In stage four, you see a slight tilt to one blade and the blade platform is raised higher than the other blades. What could be a cause of this condition and what would be your course of action?

- (a) Condition could be the result of blade root failure. Engine should be taken out of service until condition can be evaluated.
- (b) FOD damage could cause this condition. Engine can be operated at full load until next scheduled maintenance.
- (c) Metal fatigue could cause this condition. Engine can be operated but gas generator speed should be reduced.
- (d) Ice damage could cause this condition. Blade tilt should be corrected using special tool provided, then engine will be safe to operate.

If choice a is selected set score to 1.

76. (3.10.9.1-7) A compressor blade platform that is tilted or raised may indicate which of the following failures?

- (a) Blade root.
- (b) Carbony pad.
- (c) Midspan damper.
- (d) Tip clang.

If choice a is selected set score to 1.

77. (3.10.9.1-8) When tip clang takes place on a GTE, the major damage occurs to what area of the blade?

- (a) Chord
- (b) Tip
- (c) Root
- (d) Midspan

If choice c is selected set score to 1.

78. (3.10.9.3-1) You are conducting a borescope inspection of the combustor section of a LM2500 gas turbine engine. You observe a one square inch hole in the combustor dome where burn through has removed the metal. What would be your course of action?

- (a) Record the damage and continue to operate the engine while monitoring the high pressure turbine temperatures and nozzle condition.
- (b) Immediately take the engine out of service.
- (c) Operate the engine only in an emergency and at reduced load.
- (d) Make temporary repairs with on board repair kit to patch hole.

If choice a is selected set score to 1.

79. (3.10.9.3-2) The dimples of a combustor dome band that has a low operating time will usually have what kind of damage?

- ☐ (a) Burn away.
- ☐ (b) Bowing.
- ☒ (c) Cracks.
- ☐ (d) Burn through.

If choice c is selected set score to 1.

80. (3.10.9.3-3) Distortion of the combustor liner assembly is evident when you observe which of the following conditions?

- ☐ (a) The inner liner bends down into the flow path., and the outer liner lifts up into the flow path
- ☐ (b) Both the inner and outer liner bend into the flow path.
- ☒ (c) The inner liner lifts up into the flow path, and the outer liner bends down into the flow path.,
- ☐ (d) Both the inner and outer liner lift up into the flow path.

If choice c is selected set score to 1.

81. (3.10.10.1-2) Which of the following is the most probable cause if, while underway, the main propulsion gas turbine air intake blow-in doors open?

- ☐ (a) Exhaust pressures are higher than normal.
- ☐ (b) Air inlet pressures to the compressor are higher than normal.
- ☐ (c) Air inlet temperatures to the compressor are higher than normal.
- ☒ (d) Ice has formed on the air intakes.

If choice d is selected set score to 1.

82. (3.10.10.1-1) While underway on a ship with gas turbine engines, the most likely indication of an engine stall is _____.

- ☐ (a) combustor temperature increases
- ☐ (b) a loud bang is heard
- ☐ (c) engine fails to accelerate
- ☒ (d) All of the above

If choice d is selected set score to 1.

83. (3.10.10.1-3) In which of the following ways can compressor surge cause excessive temperatures in the turbine section?

- ☒ (a) By providing inadequate secondary air
- ☐ (b) By overloading the compressor
- ☐ (c) By providing excessive combustion air
- ☐ (d) All of the above

If choice a is selected set score to 1.

84. (3.10.10.2-2) On the marine gas turbine engine shown in the illustration, what temperature should be carefully monitored following a shutdown for an engine fire? Illustration GT-0017

- (a) power turbine inlet
- (b) fuel manifold
- (c) combustor liner
- (d) compressor discharge

If choice a is selected set score to 1.

85. (3.10.10.2-1) On a ship with a marine gas turbine as shown in the illustration, a fire emergency stop is initiated when _____. Illustration GT-0017

- (a) one of the UV flame detectors is activated
- (b) either the primary or reserve GTM CO2 system activates
- (c) the GTM fire emergency shutdown switch located on the module is activated
- (d) All of the above

If choice d is selected set score to 1.

86. (3.10.10.2-3) If a fire is detected in a main propulsion gas turbine enclosure, which of the following would occur prior to automatic release of the fire extinguishing agent?

- (a) Cooling water to the enclosure would be secured.
- (b) If open, bleed air valves would be closed.
- (c) Water wash valves to the engine would be opened.
- (d) Reduction gear oil systems would be secured.

If choice b is selected set score to 1.

87. (3.10.10.3-1) If after reducing power to a GTE in response to a high lube oil supply temperature alarm, the temperature continues to rise, your next step should be to _____.

- (a) check oil consumption
- (b) continue to reduce power
- (c) shutdown the engine
- (d) water wash the engine

If choice c is selected set score to 1.

88. (3.10.10.3-2) During an operation of a main propulsion gas turbine, the engine shuts down. Which of the following is the most probable reason for the shutdown?

- (a) High vibration on the gas generator.
- (b) High lube oil temperature.
- (c) Low fuel supply temperature.
- (d) Low sump oil level.

If choice a is selected set score to 1.

89. (3.10.10.3-3) Which of the following is the most likely cause for the main propulsion gas turbine engine tripping during start up?

- ☐ (a) Inlet air ice detection.
- ☐ (b) High oil filter differential pressure.
- ☐ (c) Low sump oil level.
- ☒ (d) Failure to achieve the minimum rpm in a certain period of time.

If choice d is selected set score to 1.

90. (3.10.11.1-1) On the marine gas turbine shown in the illustration, the gas generator speed sensor is located _____. Illustration GT-0017

- ☐ (a) at the compressor inlet
- ☒ (b) on the accessory gearbox
- ☐ (c) within the high pressure turbine
- ☐ (d) within the compressor

If choice b is selected set score to 1.

91. (3.10.12.0-1) On marine gas turbine engine panel shown in the illustration, which of the following conditions would prevent the auto start sequence from successfully completing? Illustration GT-0016

- ☐ (a) Propeller pitch at zero
- ☒ (b) Bleed air valve open
- ☐ (c) Fuel supply cutoff valve opened.
- ☐ (d) Starting motor not turning.

If choice b is selected set score to 1.

92. (3.10.13.1-1) What is the purpose of the LM2500 GTE enclosure heater?

- ☐ (a) To ensure enclosure temperature is maintained at 145 degrees F
- ☒ (b) To ensure fuel viscosity is maintained while the GTE is secured
- ☐ (c) To warm up the enclosure for maintenance personnel
- ☐ (d) To increase inlet air temperature

If choice b is selected set score to 1.

93. (3.10.13.1-2) A total of how many shock mounts are used to secure the LM2500 enclosure to the ship's foundation?

- ☐ (a) 16
- ☐ (b) 40
- ☐ (c) 24
- ☒ (d) 32

If choice d is selected set score to 1.

94. (3.10.13.1-3) Where are the CO₂ nozzles located in the LM2500 enclosure?

- (a) On the cross beam under the compressor front frame
- (b) Above and below the combustor section
- (c) On either side of the PT
- (d) Above the compressor

If choice a is selected set score to 1.

95. (3.10.13.1-4) What type of combustor is used by the LM2500 GTE?

- (a) Can-annular
- (b) Can
- (c) Cannular
- (d) Annular

If choice d is selected set score to 1.

96. (3.10.13.1-5) The gas generator section of the LM2500 GTE is composed of all of the following components EXCEPT which one?

- (a) Bellmouth
- (b) Two stage HP turbine
- (c) FOD screen
- (d) Six stage LP turbine

If choice d is selected set score to 1.

97. (3.10.13.1-6) The struts of the compressor front frame provide passages for all of the following mediums EXCEPT which one?

- (a) Fuel oil
- (b) Scavenge oil
- (c) Seal-pressurization air
- (d) Lube oil

If choice a is selected set score to 1.

98. (3.10.13.1-7) What is the primary purpose of the diffuser and distributor on the LM2500 GTE?

- (a) To provide even temperature distribution at the compressor
- (b) To provide uniform airflow to the combustor
- (c) To provide uniform air flow to the compressor
- (d) To provide uniform airflow to the turbine

If choice b is selected set score to 1.

99. (3.10.13.1-8) Which of the following components prevent(s) objects smaller than 1/4 inch from entering the engine?

- ☐ (a) Centerbody
- ☐ (b) Demister pads
- ☒ (c) FOD screens
- ☐ (d) Inlet louvers

If choice c is selected set score to 1.

100. (3.10.13.1-9) How is the HP turbine rotor of the LM2500 GTE cooled?

- ☐ (a) By the ship's service seawater cooling system
- ☐ (b) By synthetic lube oil
- ☐ (c) By an air to air heat exchanger
- ☒ (d) By a continuous flow of compressor discharge air

If choice d is selected set score to 1.

101. (3.10.13.1-10) How many stages are in the HP turbine of the LM2500 GTE?

- ☐ (a) One
- ☒ (b) Two
- ☐ (c) Three
- ☐ (d) Four

If choice b is selected set score to 1.

102. (3.10.13.1-11) The power turbine (PT) of the LM2500 GTE has a total of how many stages?

- ☐ (a) Seven
- ☒ (b) Six
- ☐ (c) Four
- ☐ (d) Eight

If choice b is selected set score to 1.

103. (3.10.13.2-1) What is the primary function of the main fuel control on the LM2500 GTE?

- ☐ (a) To control fuel temperature
- ☒ (b) To control stator vane angle and GG speed
- ☐ (c) To control fuel pump inlet pressure
- ☐ (d) To control stator vane angle and bleed air discharge

If choice b is selected set score to 1.

104. (3.10.13.2-2) As shown in the illustration of a gas turbine fuel oil system, when the engine fuel oil valves are de-energized, the remaining fuel left in the system is recirculated back to the _____. Illustration GT-0021

- (a) fuel pump inlet
- (b) high pressure relief valve
- (c) day tank
- (d) fuel purge manifold

If choice a is selected set score to 1.

105. (3.10.13.2-3) Marine gas turbine fuel oil systems, as shown in the illustration, require fuel oil shutdown valves to be _____. Illustration GT-0021

- (a) piped in series
- (b) piped in series-parallel
- (c) piped in parallel
- (d) manually operated from MPCMS

If choice a is selected set score to 1.

106. (3.10.13.4-1) In order to get a ready indication for a normal start with an LM2500 marine gas turbine, what permissive must be met?

- (a) Fuel supply pressure must be greater than 8 psig
- (b) Bleed air valve must be closed.
- (c) GG speed must be less than 1200 RPM and all engine trips reset.
- (d) All of the above.

If choice d is selected set score to 1.

107. (3.10.13.4-2) In the marine gas turbine engine shown in the illustration, the 9th stage bleed air is used for _____. Illustration GT-0017

- (a) compressor balance piston cavity pressurization
- (b) high pressure turbine 2nd stage nozzle cooling
- (c) sump pressurization and cooling
- (d) power turbine cooling

If choice d is selected set score to 1.

108. (3.10.13.4-3) In the marine gas turbine engine shown in the illustration, the 13th stage bleed air is used for _____. Illustration GT-0017

- (a) high pressure turbine 2nd stage nozzle cooling
- (b) power turbine cooling
- (c) power turbine balance piston cavity pressurization
- (d) sump pressurization and cooling

If choice a is selected set score to 1.

109. (3.10.13.4-4) In the marine gas turbine engine shown in the illustration, the HP turbine 2nd stage nozzle vanes are cooled by _____. Illustration GT-0020

- (a) frame vent bleed air
- (b) 16th stage compressor air
- (c) 13th stage compressor air
- (d) 9th stage compressor air

If choice c is selected set score to 1.

110. (3.10.13.4-5) As shown in the illustration, the HP turbine 2nd stage blades are cooled by convection, with the cooling air being discharged at the _____. Illustration GT-0011

- (a) trailing edge slots
- (b) blade tips
- (c) gill holes on the side
- (d) nose holes on the leading edge

If choice b is selected set score to 1.

111. (3.10.13.4-5) In the marine gas turbine engine shown in the illustration, the HP turbine 1st stage nozzle vanes are cooled by _____. Illustration GT-0020

- (a) 9th stage compressor air
- (b) 13th stage compressor air
- (c) 8th stage compressor air
- (d) 16th stage compressor air

If choice d is selected set score to 1.